AMPC
AUSTRALIAN MEAT PROCESSOR CORPORATION

Primal to steak

Traceability- Primal to Steak/Steak to Primal

Project Code	Prepared by	Date Submitted
2021-1267	Paul Ryan Emma Wheeler	24/05/22

Project Description

Typically, primals (e.g. 5+ kg in weight) leave Australian meat establishments and are exported in vacuum bags. Once received in an international location a third party will further slice and repack the primal into retail-ready portions (as depicted below). Once the transformation process has begun, it is at this point that some traceability systems do not provide a level of reliable or cost-effective continuous plate to paddock traceability. AMPC would like to explore potential technology solutions providers develop solutions to address these problems.

Value is in the eye of the beholder – and traceability of primal to steak (or steak to primal) will deliver different value to different supply chains and consumers. The types of value for different entities and consumers that might be leveraged from a cost-effective and reliable primal to steak traceability solution. This could include, but is not limited to: providing supply chain stories, forward tracking where product is being consumed (and maybe who by), interacting with consumers (who are willing to), food fraud, food safety traceback/traceforward enabler, providing other value adds to consumers (i.e. recipes), underpinning and promoting sustainability claims (in the wider sense of sustainability) promotions and food fraud monitoring.

Trust Codes develops and deploys traceability and anti-counterfeit solutions, delivery data driven intelligence and brand protection from our Cloud based platform and edge applications. Trust Codes has an existing technology solution for primal tracking in the plant, and primal>retail cut in 3rd party secondary processors using local edge-based applications.

For this project, Primal > Retail cut tracking, Trust Codes leveraged the unique QR code on a primal (printed multiple times on the bag to ensure readability) to produce tracked piece cut identifiers in a managed way.

Project Content

A full paddock to plate concept is not always required to be fit for the intended purpose of a specific traceability question/value add. This is one reason why different supply chains and auditors are already successfully leveraging different approaches to red meat traceability currently on offer.

In light of that, this call-out is specifically focused on the further and ongoing development of cost-effective and indisputable ability for a solution(s) to link a retail cut back to a primal once in the hands of a consumer, or at the point of purchase (with an assumption that the primal can be traced back to an Australian processing establishment and ideally a carcase). The latter can be provided by existing solution providers and can be leveraged by new entrants (providers) to this development area.

Many providers in the red meat traceability area have solutions that come close and may provide great existing platforms for themselves, or others, to build upon. Trust Codes worked on closing this last piece of the puzzle so that Australian producers can add value to their existing traceability solutions and offer assurance of provenance and practice to consumers all over the world.

The development was intended to track a primal in a shrink bag to a retail cut processed in a 3rd party cutting room. Much of our work was orientated on process support, rather than blindly asserting technology friendly processes that may not reflect real life activity.

Project Outcome

The outcome proved that Primal to Steak traceability was possible, but that attempts to control yield in 3rd party cutting rooms is problematic and counter intuitive for those processors.

Given the initial trials of clear primal bags with a black or blue coloured QR code (repeated 3 times on a fixed length bag) produced <70% read rates, Trust Codes proposed and tested a revision of unique per bag QR codes. The

landing point for pre-printed, unique per bag, QR code, is a QR code repeatedly printed 5 times on a white strip near the centre of the bag. This produces readability of >95% in trials. With the QR code being pre-printed on the bag, it does not contain product information and is not a GS1 Digital Link format. Printing bags at the bag supplier and getting delivery to Trust Codes was delayed to the point it could not be demonstrated within the project window.

We have demonstrated using the carton to identify primals- the functionality per primal differs because the content of the primal is not contained in the GS1 128 barcode. We have not demonstrated a primal bag > retail cut yet because we have had to re-design process flows to accommodate recent GS1 standards such as GS1 Digital Link and provide flexibility to support pre-printed bags (a licence plate system) and printing in line.

In the case of in-line printing (using Moda for example), we have proven that product information can be included in a GS1 compliant QR code and a resolver is not required.

A key process challenge has been oriented on useability of the system for customers of Australian meat producers.

We intended to design and test the Yield/Output tracking using our unique machine learning capability which is a desirable function to manage mass balance transfer/yield to help prevent substitution of primals in a traced product. However, research with customers demonstrated a number of commercial, rather than technical, barriers to applying the algorithmic yield analysis.

Our risk considerations were centred on our review of relevant factors during the research phase of this project;

a) Expectations that traceability **will not interfere** with secondary processing throughput- therefore our business logic cannot stop the processing line. Stopping processing could reflect badly on Australian producers. Accordingly, users must be able to print labels over and above yield tolerances to deal with label damage, failure etc. This creates both a yield, but also an anti-counterfeiting algorithm issue. We have not been able to reliably avoid this risk at this stage.

b) Australian producers want to ensure traceability applies to their products and the system does not allow other product to be introduced into the process- either by mistake or deliberately for economic gain.

c) We can expect a myriad of weigh scale systems in smaller secondary processing. This creates complexity about how to manage printing a unique label. Integration with Moda, Bizerba, Mettler Toledo, Wedderburn etc is manageable for larger secondary processors.

d) Delivery from the Cloud without an edge application will not be reliable enough to support busy cutting rooms and introduces technical risk factors that require more self-service and KYC functions to be useful.

Benefit for Industry

As the MLA says, "Quite simply, the red meat industry is too valuable to jeopardise its integrity through lack of traceability"[1].

Consumers are becoming increasingly curious about their food and fibre products with factors such as provenance, health and wellness attributes, farming techniques and so on becoming top of mind. There is also a huge push from

---

[1] https://www.mla.com.au/research-and-development/food-safety/red-meat-traceability-information-hub/#

consumers wanting to be educated on the products they consume, with a strong expectation that the information provided to them is underpinned by good data. In this context, Australian meat producers need to tell their story to consumers and provide evidence of the credence claims they make.

Primal to steak traceability will underpin this effort, and given the prevalence in the value chain of 3rd party cutting rooms overseas which are not under the Australian producer's control, systems are needed to manage traceability and mitigate fraudulent production insertion .

Transparency across the entire value chain

Consumers, regulators, retailers and other value chain participants now expect transparency from various aspects. One trend that requires transparency is sustainability that spans across the entire value chain. Consumers are curious and want to understand all those that touch the product in some form, and the wider impact the processes have on the environment; for example resource use on farm, animal feed, by-products, transportation and food miles, food packaging, and food waste (and everything in between) . In order to keep all matters concerning the processing of the meat clear and transparent, it is important that there is continuous information available regarding traceability, product specifications and quality. The linkage from Primal to steak is the final step in that continuous information.

Accurate and correct information about the entire production process

With the COVID-19 pandemic, and ambitious goals globally around sustainability, this has only amplifyied the increasing trend of sustainable production, consumption and the importance of quality data underpinning traceability to contribute to these claims. Traceability data must be accurate and up-to-date to meet the requirements of the consumer, purchasers and the government. Ensuring that a product and supply chain has the right information, at the right time, is critical to maximising the value that comes with supply-chain digitisation and traceability. There also needs to be a way in which data is standardised for efficiency.

Food Fraud creates distrust

The *Counting the cost: Lost Australian food and wine export sales due to fraud* report from Food Innovation Australia Ltd estimates fraud perpetrated on the industry in export markets is estimated to cost $272m/year. Food fraud creates consumer safety issues, reputational issues for Australian producers and counterfeiters effectively competing for consumer spend using a producers own brand. Linking primal to steak helps prevent insertion/substation risks if the output of the secondary process can be effectively managed. Globally, there are reports of food fraud and adulteration that leads to human health risk and potentially death. Implementing a robust system to show consumers you have control of your supply chain is increasingly critical, and will become a basic foundation in the near future.

Useful resources

https://www.gs1.org/standards/traceability/traceability/1-3-0

https://www.mla.com.au/research-and-development/food-safety/red-meat-traceability-information-hub/#

https://www.fda.gov/food/new-era-smarter-food-safety

https://www.fial.com.au/blogs/post/Lost-Australian-Food-and-Wine-Export-Sales-Due-to-Fraud#:~:text=This%20report%2C%20shows%20that%20the,dairy%2C%20wine%20and%20meat%20sectors.

https://sdgs.un.org/goals